

What is claimed is:

1. A chopper comparator circuit having a first input terminal for receiving an analog input voltage, a second input terminal for receiving a reference voltage, one to a plurality of capacitors, a first switch for connecting the first input terminal to the capacitor in the initial stage, a second switch for connecting the second input terminal to the capacitor in the initial stage, one to a plurality of inverter circuitries disposed in respective stages subsequent to one of the capacitors, one to a plurality of switches between input and output terminals for connecting between respective input and output terminals of the inverter circuitries, and an output terminal connected to the inverter circuitry in the final stage, for externally outputting an output voltage;

said inverter circuitries each comprising one to a plurality of gated inverters each comprising a first logic circuit transistor of a first conductivity type, a second logic circuit transistor of a second conductivity type, a first current control transistor of the first conductivity type, and a second current control transistor of the second conductivity type;

wherein the first logic circuit transistor and the second logic circuit transistor are connected in series, the first logic circuit transistor has a main electrode connected to a first power supply line via the first current control transistor; and

the second logic circuit transistor has a main electrode connected to a second power supply line via the second current control transistor.

2. A chopper comparator circuit according to claim 1, wherein the number of the capacitors, the inverter circuitries, and the switches between the input and output terminals, respectively, is two;

one end of the capacitor in the initial stage is connected to the first input terminal via the first switch and also to the second input terminal via the second switch, one end of the inverter circuitry in the initial stage and the switch between the input and output terminals, in the initial stage, respectively, is connected to the other end of the capacitor in the initial stage;

one end of the capacitor in a subsequent stage is connected to the other end of the inverter circuitry in the initial stage and the switch between

the input and output terminals, in the initial stage, respectively;

one end of the inverter circuitry in the subsequent stage and the switch between the input and output terminals, in the subsequent stage, respectively, is connected to the capacitor in the subsequent stage; and

the output terminal is connected to the other end of the inverter circuitry in the subsequent stage and the switch between the input and output terminals, in the subsequent stage, respectively.

3. A chopper comparator circuit according to claim 1, further comprising:

a plurality of control power supply lines at voltage levels differing from each other;

wherein the first logic circuit transistor has a control electrode connected to a control electrode of the second logic circuit transistor while connected to a constituent disposed in a preceding stage, a first main electrode connected to a second main electrode of the first current control transistor, and a second main electrode connected to a second main electrode of the second logic circuit transistor while connected to a constituent disposed in a subsequent stage;

the second logic circuit transistor has the control electrode connected to the control electrode of the first logic circuit transistor while connected to the constituent disposed in the subsequent stage, a first main electrode connected to the second main electrode of the second current control transistor, the second main electrode connected to the second main electrode of the first logic circuit transistor while connected to the constituent disposed in the subsequent stage;

the first current control transistor has a control electrode connected to a control electrode of the second current control transistor while connected to any of the control power supply lines, a first main electrode connected to the first power supply line, the second main electrode connected to the first main electrode of the first logic circuit transistor;

the second current control transistor has the control electrode connected to the control electrode of the first current control transistor while connected to any of the plurality of the control power supply lines, a first

main electrode connected to the second power supply line, the second main electrode connected to the first main electrode of the second logic circuit transistor;

the respective control electrodes of the first current control transistor and the second current control transistor, within the same inverter circuitry, are connected to the control power supply lines at the same voltage level; and

the respective gated inverters within the same inverter circuitry are connected to the control power supply lines at voltage levels differing from each other.

4. A chopper comparator circuit according to claim 3, wherein the first power supply line is the plus side of a power source, and the second power supply line is the ground.

5. A chopper comparator circuit according to claim 3, wherein an inverter is disposed between the control electrode of the first current control transistor and the control electrode of the second current control transistor.

6. A chopper comparator circuit according to claim 3, wherein the inverter circuitries each comprise two units of the gated inverters, the gated inverters in the initial stage of the respective inverter circuitries are connected to the control power supply lines at the same voltage level while the gated inverter circuits in the subsequent stage of the respective inverter circuitries are connected to the control power supply lines at the same voltage level, differing in voltage level from the control power supply lines connected to the gated inverters in the initial stage.

7. A chopper comparator circuit according to claim 1, further comprising a third current control transistor of the first conductivity type and a fourth current control transistor of the second conductivity type, wherein the first logic circuit transistor has the main electrode connected to the first power supply line via the first current control transistor, and also via the third current control transistor while the second logic circuit transistor has the main electrode connected to the second power supply line via the second current control transistor, and also via the fourth current control transistor.

8. A chopper comparator circuit according to claim 7, further comprising:

a plurality of control power supply lines at voltage levels differing from each other;

wherein the first logic circuit transistor has the control electrode connected to the control electrode of the second logic circuit transistor while connected to the constituent disposed in the preceding stage, the first main electrode connected to the second main electrode of the first current control transistor, and a second main electrode of third current control transistor, and the second main electrode connected to the second main electrode of the second logic circuit transistor while connected to the constituent disposed in the subsequent stage;

the second logic circuit transistor has the control electrode connected to the control electrode of the first logic circuit transistor while connected to the constituent disposed in the subsequent stage, the first main electrode connected to the second main electrode of the second current control transistor and a second main electrode of the fourth current control transistor, the second main electrode connected to the second main electrode of the first logic circuit transistor while connected to the constituent disposed in the subsequent stage;

the first current control transistor has the control electrode connected to the control electrode of the second current control transistor while connected to any of the plurality of the control power supply lines, the first main electrode connected to the first power supply line, the second main electrode connected to the first main electrode of the first logic circuit transistor;

the second current control transistor has the control electrode connected to the control electrode of the first current control transistor while connected to any of the plurality of the control power supply lines, the first main electrode connected to the second power supply line, the second main electrode connected to the first main electrode of the second logic circuit transistor;

the third current control transistor has a control gate connected to a

control gate of the fourth current control transistor while connected to any of the plurality of the control power supply lines, a first main electrode connected the first power supply line, and a second main electrode connected to the first main electrode of the first logic circuit transistor;

the fourth current control transistor has the control gate connected to the control gate of the third current control transistor while connected to any of the plurality of the control power supply lines, a first main electrode connected to the second power supply line, a second main electrode connected to the first main electrode of the second logic circuit transistor;

the respective control electrodes of the first current control transistor and the second current control transistor, within the same inverter circuitry, are connected to the control power supply lines at the same voltage level; and

the respective control electrodes of the third current control transistor and the fourth current control transistor, within the same inverter circuitry, are connected to the control power supply lines at the same voltage level, differing in voltage level from the control power supply lines connected to the respective control electrodes of the first current control transistor and the second current control transistor.

9. A chopper comparator circuit according to claim 1, wherein the first current control transistor has the control electrode connected to a reference voltage output based on the threshold voltage of the first current control transistor while the second current control transistor has the control electrode connected to a reference voltage output based on the threshold voltage of the second current control transistor

10. A chopper comparator circuit according to claim 9, wherein the respective first PMOS transistors are connected such that respective bulk potentials thereof become respective source potentials thereof.

11. A chopper comparator circuit according to claim 1, comprising the plurality of the inverter circuitries, wherein a Schmitt-trigger-inverter circuit having hysteresis characteristics is made up by connecting a first hysteresis-retaining transistor of the first conductivity type and a second hysteresis-retaining transistor of the second conductivity type to the inverter

circuitry in the final stage.

12. A chopper comparator circuit according to claim 11,

wherein the first hysteresis-retaining transistor has a control gate connected to a control gate of the second hysteresis-retaining transistor, the second main electrode of the first logic circuit transistor, the second main electrode of the second logic circuit transistor, within the inverter circuitry in the final stage, and the output terminal, a first main electrode of the first hysteresis-retaining transistor is connected to the first power supply line, a second main electrode thereof is connected to the first main electrode of the second logic circuit transistor, and the second main electrode of the second current control transistor, within the inverter circuitry in the final stage; and

the second hysteresis-retaining transistor has the control gate connected to the control gate of the first hysteresis-retaining transistor, the second main electrode of the first logic circuit transistor, the second main electrode of the second logic circuit transistor, within the inverter circuitry in the final stage, and the output terminal, a first main electrode of the second hysteresis-retaining transistor is connected to the second power supply line, a second main electrode thereof is connected to the first main electrode of the first logic circuit transistor, and the second main electrode of the first current control transistor, within the inverter circuitry in the final stage.